SECTION 14240
HYDRAULIC ELEVATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.2 SUMMARY

A. In accordance with Contract Documents, provide all labor, material, and services to furnish, fabricate, deliver to site, and install one hydraulic passenger elevator.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Hoistway and Pit:
1. Clear plumb elevator hoistways with variations not to exceed 1" at any point.
2. Bevel cants,15 degrees from vertical, over any rear or side wall ledges and beams that project or recess 2" or more into the hoistway, except hoistway divider beams.
3. Divider beams between adjacent elevators at each floor, pit and overhead.
4. Wall blockouts for control and signal fixtures.
5. Cutting/patching walls and floors; necessary grouting.
6. Erection of front elevator hoistway wall after elevator entrances installed.
7. Grouting around hoistway entrances after installation.
8. Pit ladders, one for each elevator, and pit screens.
9. Structural supports for jack unit, buffer impact and guide rail loads.
10. Waterproof pit. Sump and pump.
11. Protecting elevator hoistways and entrances during construction per OSHA regulations.
12. Protecting cabs, door entrance assemblies and special metal finishes from damage after installation.

B. Machine Room:
1. Enclosure with access ladders and stairs.
2. Self-closing and locking access doors.
3. Cooling and heating.
4. Painting elevator machine room walls, ceiling and floor.
5. Sealing fireproofing to prevent flaking.
6. Fire extinguisher.

C. Electrical Service, Conductors and Devices:
1. Lighting and convenience outlets in elevator pit and machine room.

2. Three-phase mainline power feeders to terminals of each elevator controller with protected, lockable "off", disconnect switch, with auxiliary contact to permit three-phase power shutoff without activating automatic lowering device.
3. Power feeders to each elevator controller for lighting and exhaust blower. Individual disconnect switch at machine room location shown on Elevator Contractor's shop drawings.
4. Signal fixture power feeders to machine room elevator control panel designated by the Elevator Contractor.
5. Power feeders to elevator intercom amplifier located in the elevator machine rooms.
6. Public and firefighters' telephone system and building announcement speaker system connections to individual elevator control panels in elevator machine room and elevator control panel in lobby panel.
7. Products-of-combustion sensors per NFPA No. 72A, Chapter 4 in each elevator lobby and machine room to initiate firefighters' return feature.
8. Temporary power and illumination to install, test and adjust elevator equipment.

D. Items Installed, But Furnished under other sections:
1. Building announcement speakers.

E. Items Furnished, But Not Installed:
1. Concrete inserts for attaching guide rail brackets.

F. Access Control (Card Reader): Coordinate elevator work and elevator access control equipment. The following access control equipment is provided by Owner:
1. Elevator Card Readers:
a. Designed to provide access control designated floors.
b. Designed to be installed inside elevator car.
c. Contains card reader and circuitry to interface with elevator control unit.

1.4 DEFINITIONS

A. Terms used are defined in the latest edition of the Safety Code for Elevators and Escalators, ASME A17.1.

B. Reference to a device or a part of the equipment applies to the number of devices or parts required to complete the installation.

1.5 QUALITY ASSURANCE

A. Approved Manufacturers:
1. Hydraulic Elevator Components: Fujitec, Kone, Otis, Schindler.
2. Car Enclosures: Brice-Southern, Fujitec, Hauenstein & Burmeister, Kone, Otis Schindler, Tyler.

3. Passenger Hoistway Entrances: Brice-Southern, Fujitec, Hauenstein & Burmeister, Kone, Otis, Schindler, Tyler.

B. Document Verification: In order to discover and resolve conflicts or lack of definition, elevator Bidders must review contract documents for compatibility with their products prior to bidding. Review structural, architectural, electrical and mechanical drawings, and specifications. Attach specific, written exceptions and/or clarifications with quotation. Bidder's compliance with all provisions of contract documents is required in absence of written exceptions. Cost of changes to structural, mechanical, electrical or other systems required to accommodate bidders equipment shall be assumed by the Elevator Sub-Contractor if not identified prior to contract award.

C. Compliance with Regulatory Agencies: Comply with most-stringent applicable provisions of following Codes and/or Authorities, including revisions and changes in effect on date of these specifications:
1. Safety Code for Elevators and Escalators ASME A17.1.
2. Inspectors' Manual, ASME A17.2.
3. National Electrical Code, No. ANSI/NFPA 70.
4. Requirements of Local Building Code and any other Codes, Ordinances and Laws applicable within the governing jurisdiction.

D. Warranty:
1. Unless due to ordinary wear and tear, or improper use or care by Purchaser, correct defects which develop within one year from date of final acceptance of elevator work to the satisfaction of the Architect, Owner, or Consultant at no additional cost.
2. Perform modifications, adjustments, improvements, etc., to meet performance requirements in Parts 2 and 3.

E. Date-Related Operational Compliance: All computer programming, including but not limited to software and firmware, in all elevator system components, including the monitoring system, shall be free from any and all operational defects which may be caused by date recognition.

1.6 SUBMITTALS

A. Within 60 days after award of contract, and before beginning equipment fabrication submit shop drawings and required material for review as outlined in Division I. Allow 15 days for response to submittals.

B. Scaled or Fully Dimensioned Layouts: Plan of pit, hoistway and machine room indicating equipment arrangement, elevation section of hoistway, details of car enclosures, etc.

C. Design Information: Indicate equipment lists, reactions and design information on layouts. Include design information used to select vibration isolation system.

Provide catalog cuts, including manufacturer's recommended application for each isolator. Submit samples of each isolator for review.

D. Power Confirmation Sheets: Include motor horse power, code letter, starting current, full load running current, and demand factor for applicable motors.

E. Finish Material: Submit 3" x 12" samples or 12" lengths of actual finished materials for Architect's review of color, pattern and texture only. Compliance with other requirements is the exclusive responsibility of the Elevator Contractor. Include signal units, pushbuttons, lights, graphics, Braille plates and mounting provisions.
   1. Fixtures: Cuts, samples, or shop drawings.

1.7 PERMITS, TESTS AND INSPECTIONS

A. Obtain and pay for permits, licenses and inspection fees necessary to complete the elevator installation.

B. Perform tests required by Consultant, Governing Authority and/or the ASME A17.1 Safety Code For Elevators And Escalators, with procedures described in ASME A17.2 Inspectors' Manual for Elevators and Escalators, in the presence of authorized Representatives.

C. Supply personnel and equipment for tests and final reviews indicated in Part 3 at no added cost.

1.8 TEMPORARY USE

A. Do not use elevators for construction purposes, or during the construction period of the building without written permission from the Architect, Construction Manager, and Owner.

B. Temporary service, if permitted by Owner, will require the Construction Manager to provide the following at no additional cost to the Owner:
   1. Execute the elevator supplier's standard temporary acceptance forms and pay per diem maintenance costs.
   2. Before acceptance by Owner, perform repairs, replacement, and cleaning as needed to restore the elevator equipment to its original new condition.

1.9 MAINTENANCE

A. Included with New Equipment Contract, Warranty Period:
   1. Preventive maintenance and unlimited 7-day 24-hour emergency call-back service, in accordance with requirements of the enclosed maintenance agreement, on all equipment described herein for a period of 12 months commencing on date of final acceptance of all elevators by Owner. Systematically examine, adjust, clean and lubricate all equipment. Repair or replace defective electrical and mechanical parts using parts produced

by the Manufacturer of installed equipment. Maintain elevator machine rooms, hoistways, and pits in clean condition.

2. Use competent personnel supervised and employed by the Elevator Subcontractor.
3. Indicate cost for this maintenance with the bid. The Owner may elect to add this cost to the installation contract or pay for this service on a monthly basis as work is performed. Indicate amount for this maintenance on the bid form.

B. Contract, Continuing Preventive Maintenance Program: Quote monthly cost for 5-year maintenance agreement commencing on completion of the 12-month period in "A" above. Submit quote based upon terms and conditions of the Contractor's standard form of agreement. Base on current costs; price adjustment will be allowed at commencement date and thereafter as provided in agreement.

1.10 VISIBLE ITEMS

A. No exposed fasteners or manufacturer's logo's shall be visible to elevator users.

PART 2 - PRODUCTS

2.1 SUMMARY

A. Elevator Number (CNMS):
1. Rated Load: 5000#
2. Rated Speed: 150 FPM
3. Floors Served: B1, O1 - O3
4. Travel Distance: 46'-8"
5. Openings: 4
6. Platform Size: 6'-0" x 9'-6"
7. Inside Clear: 5'-8" x 8'-7"

2.2 MATERIALS

A. Steel:
1. Sheet Steel (Furniture Steel for Exposed Work): Stretcher-leveled, cold-rolled, commercial-quality carbon steel, complying with ASTM A366, matte finish.
2. Sheet Steel (for Unexposed Work): Hot-rolled, commercial-quality carbon steel, pickled and oiled, complying with ASTM A569.
3. Structural Steel Shapes and Plates: ASTM A6, ASTM A36, and ASTM A108.

B. Stainless Steel: Type 302 or 304 complying with ASTM A167, with standard tempers and hardness required for fabrication, strength and durability.

C. Apply mechanical finish on fabricated work in the locations shown or specified. NAAMM nomenclature with texture and reflectivity required to match Architect's sample. Protect with adhesive-paper covering.
   1. No. 4: Bright directional polish (satin finish). Graining directions as shown, or if not shown, in longest dimension.
   2. No. 8: Reflective polish (mirror finish).

D. Aluminum: Extrusions per ASTM B221; sheet and plate per ASTM B209.

E. Paint: Clean exposed metal of oil, grease, scale and other foreign matter and factory paint one shop coat of Manufacturer's standard rust-resistant primer. After installation, provide one finish coat of industrial enamel paint.

F. Prime Finish: Clean all surfaces receiving a painted finish of oil, grease, scale, etc. Apply one coat of rust-resistant mineral paint followed by a filler coat over uneven surfaces. Sand smooth and apply final coat of primer paint.

G. Baked Enamel: Prime per "G" above. Apply and bake 3 additional coats of enamel in the selected solid color.

2.3 PERFORMANCE

A. Speed: +/- 10% of contract speed under any loading condition.

B. Capacity: Safely lower, stop, and hold up to 125% of rated load.

C. Stopping Accuracy: +/- 1/4" under any loading condition.

D. Door Opening Time: As from start of opening to fully open: 2.4 seconds.

E. Floor-to-Floor Performance Time: Seconds from start of doors closing until doors are 3/4 open and car level and stopped at next successive floor under any loading condition or travel direction, 14’-0” floor height: 16.1

F. Pressure: Design and factory test fluid system components for 500 p.s.i. Do not exceed operating pressure of 400 p.s.i.

2.4 OPERATION

A. Selective Collective: Operate elevator without an attendant from buttons in car and at each landing. When elevator is idle, automatically start car, dispatch to floor associated with registered call. Respond to calls in direction of travel in the order floors are reached.

B. Do not reverse direction unless all car calls have been extinguished or until all hall calls ahead of the elevator have been answered.

C. Stop automatically for registered calls, in the same direction as elevator travel. Extinguish call as slowdown is initiated, and hold elevator for an adjustable

interval to meet accessibility requirements and to allow passenger transfer. Illuminate pushbutton when all is registered; extinguish light when call is answered. Park elevator at Ground floor in absence of demand.

D. Door Operation: Open doors automatically when the car arrives at a floor to permit transfer of passengers. Automatically close doors after a field-adjustable timed interval.

E. Automatic Stopping Accuracy: Two-way automatic with re-leveling feature stop elevator within 1/4" above or below the landing sill. Avoid overtravel, as well as undertravel and maintain stopping accuracy regardless of load in elevator or direction of travel.

F. Independent Service: Provide controls for operation of each elevator from car buttons only. Close doors by constant pressure on desired destination floor button. Open doors automatically upon arrival at selected floor.

G. Low-Oil Control: In the event oil level is insufficient for travel to the top floor, provide controls to return elevator to the lowest level and park until oil is added. Provide low-oil indicator display in Lobby Panel.

H. Motion Control: AC type with unit valve suitable for operation specified and capable of providing smooth, comfortable acceleration, retardation and dynamic braking. Limit the difference in speed between full load and no load to not more than +/- 10% of the contract speed.

I. Firefighters' Service: Per Code, to operate and recall elevators to designated or alternate designated floors in fire or other emergency condition. Provide sensor signal wiring from hoistway or machine room connection point to controller terminals. Provide similar operation and fixtures on all elevators. Operate visual/audible signal until return is complete or automatic operation restored.

J. Standby Lighting and Alarm: Car-mounted, battery unit with solid-state charger to operate alarm bell and lighting, per Code. Battery to be rechargeable with 5-year minimum-life expectancy. Provide momentary test button in service cabinet of car station which causes illumination of standby lighting bulbs. Illuminate normal car lighting, operate ventilation blower, and maintain alarm bell operability for Code-required duration using standby battery source.

K. Standby Power Source: Provide controls to automatically lower the cars nonstop to the lowest landing using DC battery power source installed in machine room in event of failure of normal power. Include solid-state charger and testing means mounted in a common metal container. Provide rechargeable lead acid or nickel cadmium battery with 10-year minimum life expectancy. Provide switch in controller to disconnect unit during maintenance. Provide operating instructions adjacent to switch. Upon failure of normal power, lower elevators to landing, open doors automatically, hold open until regular

door time has expired, then close doors and shut elevator down. Automatically resume normal operation when power is restored.

2.5 MACHINE ROOM EQUIPMENT

A. Arrange equipment in spaces shown on drawings. Provide identifying numbers on pump unit, controller, and disconnect switch.

B. Pump Unit: Assembled unit consisting of positive-displacement pump, induction motor, master-type control valves combining safety features, holding, direction, bypass, stopping and manual-lowering functions, shut-off valve, oil reservoir with protected-vent opening, oil gage and outlet strainer, drip pan and connections all mounted on isolating pads. Provide thermal unit or comparable means to maintain oil at operating temperature. Enclose non-submersible units with removable sheet steel panels lined with sound-absorbing material. Pump, motor, and valve may be mounted under tank.

C. Selector: Solid-state type electrically coupled to elevator.

D. Controller: Cabinet type, removable doors and adequate ventilation to dissipate heat. Wire to identified terminal block studs. Identifying symbols or letters identical to those on wiring diagrams permanently marked adjacent to each component on the controller.
   1. Frame: Securely mount all assemblies, power supplies, chassis switches, relays and other items on a substantial, self-supporting steel frame. Completely enclose equipment with covers and ventilate to prevent overheating.
   2. Switch and Relay Design: Direct-current type, magnet operated with contacts of design and material to insure maximum conductivity, long life and reliable operation without overheating or excessive wear, and provide a wiping action to prevent sticking due to fusion. Provide switches carrying highly inductive currents with arc deflectors or suppressers.
   3. Power Supplies: UL or CSA recognized, with short-circuit protection.
   4. Wiring: CSA labeled copper wires for factory wiring. Neatly route all wiring interconnections and securely attach wiring connections to studs or terminals.
   5. Provide reduced voltage motor starting circuits.
   6. Controller shall be non-proprietary, microprocessor-based. Provide all necessary diagnostic equipment, software, written instructions, and on-site training to allow all maintenance, troubleshooting, and re-programming functions to be successfully performed by a third party of the Owner's choosing.

E. Muffler: Provide in discharge oil line near pump unit. Design to dampen and absorb pulsation and noise in the flow of hydraulic fluid.

F. Piping and Oil: Provide piping, connections and oil for the system. Use isolated couplings between the pump unit and oil lines. Utilize vibration-isolated hangers and supports for all piping.

G. Shutoff Valve: Manual valve in line adjacent to pump unit. Provide second valve in pit adjacent to jack unit.

H. Noise and Vibration Control:
   1. Minimize noise and vibration in occupied areas. Mechanically isolate elevator equipment from the structure and electrically isolate controllers and motor. Utilize vibration-isolated hangers and supports for all piping. Design vibration isolation for the specific frequency range generated by equipment. Sleeve and fire stop all wall penetrations to preserve rating and minimize sound transmission.
   2. Limit noise level relating to elevator equipment and its operation to no more than 60 dBA in elevator cars under any condition including door operation and exhaust blower on highest speed.

2.6 HOISTWAY EQUIPMENT

A. Guide Rails: Planed steel T-sections suitable for elevator travel, car weight, with brackets for attachment to building structure. Provide backing to meet Code requirements. Note distance between supports.

B. Buffers: Spring type with blocking and supports.

C. Cylinder: Seamless steel pipe. Design head to receive unit type packing and provide means to collect oil at cylinder head and pump to return to oil reservoir.

D. Plunger: Polished seamless steel tubing or pipe. If plunger length exceeds 24', provide 2 or more sections not exceeding 16' in length, or coordinate installation of longer unit at the jobsite. Join section by internal threaded couplings. Factory polish multiple section jack units while assembled and mark for proper future re-assembly. Isolate plunger from car sling.

E. Jack Support: Provide steel channels to support jack and transmit loads to building structure.

F. Normal and Final Terminal Stopping Devices: Per Code.

G. Electrical Wiring and Wiring Connections:
   1. Conductors and Connections: Copper throughout with individual wires coded and connections on identified studs or terminal blocks. Use no splices or similar connections in wiring except at terminal blocks, control cabinets, junction boxes, or conduits. Provide 10% spare conductors throughout. Provide four pairs of shielded communication wires in addition to those required to connect specified items. Run spare wires from car connection points to individual elevator controllers in the machine room. Tag spares so they can be identified in the machine room.

2. Conduit, Etc.: Painted or galvanized steel conduit and duct. Do not use flexible conduit exceeding 72" in length. Flexible heavy-duty service cord may be used between fixed car wiring and car door switches for door protective devices.
3. Traveling Cables: Flame and moisture-resistant outer cover. Prevent traveling cables from rubbing or chafing against hoistway or elevator equipment within hoistway.
4. Life Safety: Connect smoke sensors, telephones, jacks and speakers to designated point adjacent to hoistway or in machine room.

H. Entrance Equipment:
1. Door Hangers: Two-point suspension with upthrust adjustment. Tire rollers so that no metal-to-metal contact exists.
2. Door Tracks: Removable bar or formed, cold drawn steel with smooth hanger contact surface.
3. Interlocks: Provide type operable without retiring cam. Paint interlocks flat black.
4. Closers: Spring or spirator type.

I. Pit Stop Switch: Per Code.

J. Floor Numbers: Stencil Painted 4" high floor numbers within the hoistway per Code.

2.7 HOISTWAY ENTRANCES:

A. Complete entrances as follows:
1. Elevator (CNMS):
a. Entrance Type: Two Speed
b. Size: 4’-0” x 9’-6”
c. Finish: Stainless Steel, #4

B. Frames: Hollow metal, fabricated from not less than 14 U.S. gage material to form a one-piece unit. Show jamb and head depth and profiles on approval drawings. Permanently attach handicapped floor designations 2" high, raised 0.030", with lettering, style, and color selected by the Architect, 60" above the floor. Provide stud-mounted designations with registration pins. Provide welded frames with joints ground smooth.

C. Door Panels: Minimum thickness of no. 14 U.S. gage steel, sandwich construction without binder angles. Provide a minimum of 2 gibs per door panel, one at leading and one at trailing edge with gibs in the sill groove their entire length of travel.

D. Sight Guards: 14 gage material, same material, height, and finish as hoistway entrance door panels.

E. Sills: Extruded nickel silver.

F. Sill Support Angles: Structural or formed shape designed to support sill without need for grouting.

G. Fascia, Toe Guards and Hanger Covers: Provide for all entrances, No. 14 U. S. gage galvanized steel, full width of hoistway. Make hanger covers same width as fascia.

H. Struts and Headers: Provide for support of entrances and related material. Provide door open bumpers on entrances equipped with vertical struts.

I. Unlocking Devices: Provide unlocking devices at all entrances with stainless steel escutcheons.

2.8 CAR EQUIPMENT

A. Car frame: Welded or bolted, rolled or formed steel channel construction. Isolate from jack unit.

B. Platform: Construct of steel or plywood with fireproofing sheet.

C. Guide Shoes: Roller type with three adjustable, coil spring-loaded tires per shoe, Elsco Model B.

D. Finish Floor Covering: Steel checkered plate, ¼-inch thick.

E. Car Sills: Full depth extruded nickel silver.

F. Toe Guard: Per Code.

G. Car Door Hangers and Tracks: Provide as specified for hoistway entrance doors, hangers and tracks.

H. Header: Steel, shaped to provide stiffening flanges.

I. Car Door Electrical Contact: Arrange so that elevator cannot operate unless doors or gates are closed within tolerance allowed by Code.

J. Car Door Clutches: Heavy-duty clutches, linkage arms, drive blocks and pickup rollers or cams to provide positive, smooth, quiet door operation. Design clutches so car doors can be closed for maintenance purposes, while hoistway doors remain open.

K. Door Operator and Operation: High-speed, heavy-duty, master door operator capable of opening doors at no less than 2-1/2 f.p.s., and accomplishing reversal in no more than 2-1/2" of door movement. Open doors automatically when car arrives at a floor to permit passenger transfer. Close doors automatically after an adjustable timed interval. Provide closed-loop control over position, velocity, current, and voltage. Provide integral restrictor device.
   1. MAC HPM

2. Otis Lim
3. Schindler QKS-15

L. Infrared Detector Device: Pulsed screen car door protective device with a minimum of 2 photo eyes projecting across entire entrance opening. If detector is obstructed for a predetermined, adjustable interval (20 - 30 seconds), sound electronic tone and attempt to close doors with a maximum of 2.5 foot pounds kinetic energy. Provide Janus Panaforty or approved equal.

M. Differential Door Time: Provide separately adjustable timers to enable varying time that doors remain open after stopping in response to calls.
1. Car call: Hold open time adjustable between 3 and 4 seconds.
2. Landing call: Hold open time adjustable between 5 and 8 seconds. Use landing call timing when responding to coincidental calls.

N. Elevator Car Station:
1. Provide one car station without faceplate consisting of a metal box containing the operating fixtures, mounted behind the car enclosure swing front return panel.
2. Suitably identify floor buttons, alarm button, door open button and emergency stop switch by raised Tactile symbols per A.D.A. Standards. Mount markings with threaded fastenings only. Locate operating controls no higher than 48" above the car floor; 35", for alarm button. Provide vandal-resistant buttons as manufactured by Adams, or approved equal. Provide LED illumination for all pushbuttons.
3. Provide 1/8" raised floor pushbuttons which illuminate to indicate call registration.
4. Provide illuminating alarm button at bottom of station to ring bell located on elevator. Provide illuminating button to initiate two-way voice communication.
5. Provide stop switch in lockable service cabinet.
6. Provide one firefighters' service key switch with engraved instructions per local requirement, light jewel, buzzer and call cancel button.
7. Provide lockable service panel with recessed, flush cover plate matching return panel. Include the following controls, with purpose and operating positions identified by engraved letters painted black:
    a. Inspection switch, conforming to the Code, for disconnecting automatic operation, limiting the car speed and activating hoistway access switch when car is at terminal landing.
    b. Light switch.
    c. Three-position exhaust blower switch.
    d. Independent service switch to permit selection of independent or automatic operation.
    e. Start button for closing doors and starting elevator when operating on independent service. Floor pushbuttons may be used for this function.
    f. Duplex 120 volt, AC, electrical convenience outlet.
    g. Cab lighting dimmer switch if incandescent lights provided.

h. Equip service cabinet door with properly-sized integral cutout and transparent cover for inspection certificate.

8. Provide pushbutton to extend door hold open time for an adjustable period up to 30-seconds. Registration or re-registration shall cancel extended time.
9. Provide black paint filled engraving on car station with size and style approved by Architect as follows:
   a. "No Smoking"
   b. Elevator number.
   c. Elevator capacity in pounds.
10. Faceplate Material and Finish: Stainless steel.

O. Car Top Control Station: Provide per Code.

P. Emergency Exits: Per Code, with contact.

Q. Work Light and Duplex Plug Receptacle: Top and bottom of elevator car. Provide lights with on-off switch and non-conductive bulb guard.

2.9 CAR ENCLOSURES

A. Provide the following features:
1. Shell: Reinforced 14-gage furniture steel with baked enamel interior finish. Apply sound-deadening mastic to exterior. Provide 10'-0" shell.
2. Top: Reinforced 12-gage furniture steel with hinged exit openable from car top only. Size top exit to permit ready removal of ceiling panel. Finish with white, reflective baked enamel.
3. Front Return Panels and Integral Entrance Columns: Stainless steel, 14 ga., #4 finish.
4. Transom: Stainless steel, 14 ga., #4 finish.
5. Car Door Panels: Stainless steel, 14 ga., #4 finish.
6. Base: Stainless steel, #4 finish.
7. Cab Side and Rear Walls: ¾-inch MDF wrapped with 18ga. Stainless steel, 5WL pattern.
8. Ventilation: 2-speed exhaust blower mounted on isolated rubber grommets, Morrison Products, Model OE with diffuser and grille.
9. Lighting: Fluorescent fixtures, with electronic ballasts, mounted in stainless steel coves on side walls.
10. Handrails: Double row of 3/8" x 6" stainless steel bars mounted to side walls, removable from interior of enclosure. Reinforce car enclosure shell for mounting.
11. Trim material and finish: Stainless steel, #4 finish.

2.10 LANDING CONTROL STATIONS

A. Pushbuttons: Provide one riser flush mounted as shown. Include pushbuttons for each direction of travel which illuminate to indicate call registration. Etch, to a minimum depth of 0.02-inches and fill integral safety message, per A17.1,

Appendix H in pushbutton faceplate. Provide vandal resistant fixtures, as manufactured by Adams, Innovation, or approved equal. Provide LED illumination.

B. Hoistway Access Switches: Mount in entrance frame side jamb without faceplate. Provide at all top terminals and bottom terminals of elevators without walk-in pits.

C. Faceplate Material and Finish:
   1. Hall Pushbutton Station: Stainless steel #4.

2.11 SIGNALS

A. Hall Lanterns: Provide at each entrance to indicate direction of travel of arriving elevator to waiting passengers. Illuminate indicators with shielded lights, and sound electronic tone mechanism mounted in a metal box fastened in the wall. Illuminate up or down lights and sound tone as car approaches intended landing. Illuminate light until the elevator doors start to close. Confirm location with CM.

B. Car Position Indicator: Metal box mounted above the car pushbuttons containing indications representing the floor served and the direction of car travel. Locate in each elevator cab car station. When a car leaves or passes a floor, illuminate numeral representing position of car in hoistway. Illuminate proper direction arrow to indicate the direction of travel. Use vandal-resistant incandescent indicators. Provide electronic floor passing tone of adjustable volume. Confirm location with CM.

C. Low Oil Indicator: Provide indication in Lobby display to indicate parked car results from low oil.

D. Hall Lantern Faceplate Material and Finish: Stainless Steel #4.

2.12 COMMUNICATION SYSTEM

A. Provide full duplex type hands-free telephone actuated by communication button in one car station of each elevator, mounted integrally in one front return panel with speaker grille. Terminate wiring in junction box on each elevator controller. Provide master station in fire-command center which allows origination and receipt of communication to any elevator. Provide device which automatically dials an alternate number should call to primary destination remain unanswered after four rings. Provide station in each machine room capable of initiating and responding to communication between elevators associated with that machine room. Master and machine room stations shall provide illuminating numerals representing elevators initiating or responding to communication. Voice signal shall be static-free and have volume readily adjustable.

B. Mount fire command station integral with other functional devices specified for all elevators. Provide all conduit and wiring for a complete, functioning installation. Provide stainless steel, #4 finish faceplate.

C. In addition, provide a speaker with grille, mounted above dropped ceiling for building annunciation. Provide traveling cable between speaker and clearly-marked controller studs for connection to annunciation system.

D. Install firefighters' phone jack in front return panel. Provide traveling cable between jack and clearly-marked controller studs for connection to communication system.

2.13 FIRE COMMAND PANEL AND MONITORING PANELS

A. Provide one Fire Command Display consisting of digital-type position and direction readouts for each elevator, out-of-service conditions, standby power operation, and status of two-way communication system. Provide code-compliant standby-power selection switches. Coordinate design with console manufacturer.

PART 3 - EXECUTION

3.1 SITE CONDITION INSPECTION

A. Prior to beginning installation of equipment, examine hoistway and machine room areas. Verify that no irregularities exist which affect execution of work specified.

B. Do not proceed with installation until work in place conforms to project requirements.

3.2 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in Manufacturer's original, unopened protective packaging.

B. Store material in original protective packaging. Prevent soiling, physical damage, and wetting.

C. Protect equipment and exposed finishes during transportation, erection, and construction against damage and stains.

3.3 INSTALLATION

A. Install each equipment item in accordance with Manufacturer's direction, referenced codes, and specifications.

B. Install machine room equipment with clearances in accordance with referenced codes and specifications.

C. Install items so they may be easily removed for maintenance and repair.

D. Install items so that access for maintenance is safe and readily available.

E. Clean the following items of oil, grease, scale, and other foreign matter, and apply one coat of field-applied machinery enamel.
   1. All exposed equipment and metal work installed as part of this work which does not have architectural finish.
   2. Machine room equipment.
   3. Base and shank of rails.
   4. Neatly touch up damaged factory painted surfaces with original paint and color. Protect machine-finish surfaces against corrosion.

F. Well Hole and Casing: Drill required well hole; remove excess excavated material. Base drilling cost on conditions common to the area, and as indicated by soils test reports on file with the Architect. Install steel casing, 18" minimum diameter and 1/4" minimum wall thickness if needed to maintain the excavation. Install PVC pipe inner casing with sealed bottom. Install casing so that pit waterproofing is maintained. After jack unit is set, fill remaining space with loose, clean sand.

3.4 FIELD QUALITY CONTROL

A. Work at the jobsite will be checked during the course of installation. Full cooperation with reviewing personnel is mandatory. Accomplish corrective work required prior to performing further installation.

B. Have Code Authority acceptance inspection performed and complete corrective work.

3.5 ADJUSTMENTS

A. Align guide rails vertically with tolerance of 1/16". Secure joints without gaps and file any irregularities to a smooth surface.

B. Balance cars to equalize force of guide rollers on rails.

C. Lubricate all equipment in accordance with manufacturer's instructions.

D. Adjust motors, pumps, valves, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks and safety devices, etc., to achieve required performance levels.

E. Fabricate and assemble various parts in shop to minimize field assembly. Assemble parts which require close field fit in the shop and mark for field erection.

3.6 CLEANUP

A. Keep work areas orderly and free from debris during progress of project. Remove packaging materials on a daily basis as equipment is installed.

B. Remove all loose materials and filings resulting from work.

C. Clean machine room equipment and floor of dirt, oil and grease.

D. Clean hoistways, cars, car enclosures, entrances, operating and signal fixtures, and trim of dirt, oil, grease, and finger marks.

3.7 ACCEPTANCE INSPECTION AND TESTS

A. General: Furnish labor, materials, and equipment necessary for tests. Notify Construction Manager a minimum of 7 days in advance when ready for final review of each elevator unit or group. Final acceptance of installation will be made only after all field-quality control reviews have been completed, identified deficiencies have been corrected, all submittals and certificates have been received, and the following items have been completed to satisfaction of Owner and Elevator Consultant.
   1. Workmanship and equipment comply with specification.
   2. Contract speed, capacity and floor-to-floor performance comply with specification.
   3. Performance of following are satisfactory:
      a. Starting, accelerating, running
      b. Decelerating, stopping accuracy
      c. Door operation and closing force
      d. Equipment noise levels
      e. All aspects of ride quality

B. Performance Guarantee: Should tests reveal defects, poor workmanship, variance or noncompliance with the requirements of specifications, complete corrective work to satisfaction of Owner at no cost:
   1. Replace equipment that does not meet specification requirements.
   2. Perform work and furnish labor, materials and equipment necessary to meet specified operation and performance.
   3. Perform and assume cost for re-testing required by Governing Code Authority and Owner to verify specified operation and/or performance.

3.8 OWNER'S INFORMATION

A. Provide 4 sets of neatly bound written information necessary for proper maintenance and adjustment of equipment within 30 days following final acceptance. Final retention will be withheld until data are received by Owner and approved by Elevator Consultant. Include the following as minimums, with one set of each on CD-ROM in Adobe Acrobat format with linked indexes for all files. CD-ROM to allow viewing, copying, and printing of all files.

1. Straight-line wiring diagram of "as-installed" elevator circuits, with index of location and function of components. Mount installation wiring diagrams on panels, racked, or similarly protected, in elevator machine room. Maintain with addition of all subsequent changes. These diagrams are Owner's property. One set to be reproducible master on mylar, minimum of “C” size sheets.
2. Lubricating instructions, including recommended grade of lubricants.
3. Parts catalogs for all replaceable parts including ordering forms and instructions.
4. All diagnostic and test equipment and complete written instructions unique to troubleshooting and maintenance of equipment installed under this contract. Provide written instructions and a minimum of 4-hours on-site, adjuster-led, training to Owner’s designated personnel regarding use of all equipment for all purposes. Diagnostic and test equipment shall not require any re-setting or re-programming of any type to maintain complete functionality in perpetuity.

B. Acceptance of the installation by General Contractor and/or Owner shall not operate to relieve Elevator Contractor of responsibility to fully comply with requirements of this Article.

END OF SECTION 14240